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APPEAL BRIEF

Applicant : Jan Hall
App. No : 10/582,919
Filed : April 12, 2007
For : IMPLANT
Examiner : Mai, Hao D
Art Unit : 3732
Conf # : 9222

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/Rabinder N. Narula/

Rabinder N. Narula, Reg. No. 53,371

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Alexandria, VA 22313-1450

Sir:

In accordance with the Notice of Appeal filed, Appellants submit this Appeal Brief for consideration in U.S. Patent Application No. 10/582,919, entitled IMPLANT.

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I. REAL PARTY IN INTEREST

The real party in interest is Nobel Biocare Services AG, Balz Zimmerman-Strasse 7, 8152 Glattbrugg, Switzerland, which is the owner of the patent application by virtue of an assignment from the inventor at Reel No. 019162, Frame No. 0664.

II. RELATED APPEALS AND INTERFERENCES

No related appeals, interferences, or court proceedings are currently pending.

III. STATUS OF CLAIMS

Claims 1, 2, 4, 5, 7-10, 12, and 14-25 are currently pending in the application and are the subject of this appeal. Claims 3, 6, 11, and 13 were canceled previously. Claims 1, 2, 4, 5, 7-10, 12, and 14-25 were rejected in the Final Office Action dated July 28, 2011. The pending claims are listed in the Claims Appendix.

IV. STATUS OF AMENDMENTS

No amendments are outstanding.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claims 1, 2, 4, 5, 7-10, 12, and 14-25 are being appealed. Claims 2, 4, 5, 7-10, 12, 14, 16, and 20-22 depend from Claim 1. Claims 17-19 and 23-25 depend from independent Claim 15. Claim 1 is directed to a dental implant and reads:

A dental implant for insertion into a hole formed in jaw bone and overlying soft tissue, the dental implant comprising:

an upper portion to be placed against an upper edge of the jaw bone (*see* Present Application, page 4, lines 8-10), the upper portion comprising at least one groove which extends all around an outer surface of the upper portion to form a closed loop and which extends substantially in a cross sectional plane at right angles to the longitudinal axis of the implant (*see id.* at page 2, line 7 to page 3, line 11; page 4, lines 36-39; and Figures 2-5), said groove having a cup-shaped cross section and having a depth of between about 50 - 100 μm and having a width of between about 70 - 160 μm (*see id.* at page 6, line 22 to page 7, line 3 and Figures 4-5).

Further, Claim 15 is directed to a method for placing a dental implant and reads:

A method of placing a dental implant, the method comprising:

providing an implant having an upper portion comprising at least one groove which extends in a closed track around a periphery of the implant and which extends substantially in a cross sectional plane at right angles to the longitudinal axis of the implant (*see id.* at page 2, line 7 to page 3, line 11; page 4, lines 36-39; and Figures 2-5), said groove having a cup-shaped cross section and having a depth of between about 50 - 100 μm and having a width of between about 70 - 160 μm (*see id.* at page 6, line 22 to page 7, line 3 and Figures 4-5);

installing the implant into a jaw bone of a patient (*see id.* at page 5, lines 2-5 and page 6, lines 3-5); and

positioning the upper portion of the implant against an upper edge of the jaw bone (*see id.* at page 5, lines 2-5 and page 6, lines 3-5), the groove stimulating bone movement and bone ingrowth to form a barrier against substantial or visible subsidence, around the portion, of the jaw bone with overlying soft tissue (*see id.* at page 1, line 37 to page 2, line 15 and page 5, lines 9-28).

With respect to one illustrated embodiment, Figures 2 and 5 of the present Application illustrate views of an implant comprising an upper portion and at least one groove according to an embodiment within the scope of amended Claims 1 and 15. As shown in Figure 2, the implant 4' includes an upper portion 4b' that is placed against an upper edge 2b of the jaw bone 2. The upper portion 4b' includes at least one groove 9 which extends all around an outer surface of the upper portion 4b' to form a closed loop and which extends substantially in a cross sectional plane at right angles to the longitudinal axis 4e of the implant 4'. The groove 9 has a cup-shaped cross section, as shown in Figure 5. The groove 9 has a depth D of between about 50 - 100 μm and having a width B of between about 70 - 160 μm .

Fig. 2

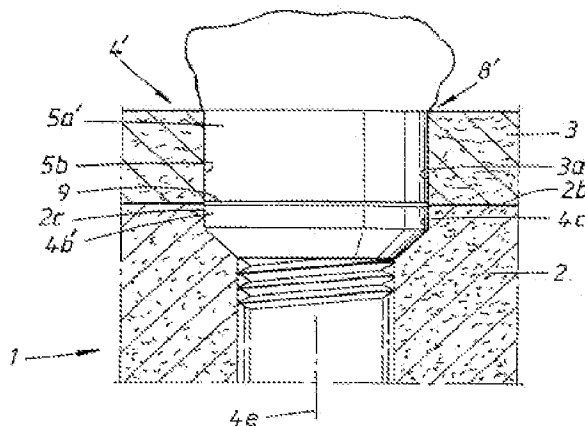
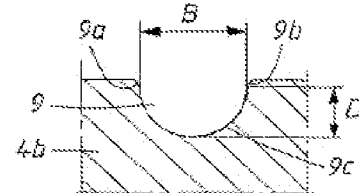


Fig. 5



Implants and their methods of use, within the scope of the present claims, promote effective bone movement and ingrowth of bones into the groove(s) of the implant. The bone movement and ingrowth stimulated by the groove(s) give rise to good integration between the implant part in question and the bone. No known implant has used or suggested the use of a groove(s) of the size and shape recited, to extend all around an outer surface of the upper portion in a closed loop, to provide such excellent advantages. By providing bone growth at the upper edge of the jawbone, a stable foundation is provided soft tissue growth.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. The rejection of Claims 1-2, 4-5, 7-10, 12, 14-17 and 19 under Section 103(a) as being obvious over U.S. Patent No. 4,744,754 issued to Ross (hereinafter "Ross") in view of U.S. Patent No. 4,723,913 issued to Bergman (hereinafter "Bergman") and U.S. Patent No. 6,419,491 issued to Ricci, et al. (hereinafter "Ricci").

B. The rejection of Claim 18 under Section 103(a) as being unpatentable over Ross in view of Bergman and Ricci, and further in view of U.S. Publication No. 2004/0142304 issued to Cottrell (hereinafter "Cottrell").

C. The rejection of Claims 20-21 and 23-24 under 103(a) as being unpatentable over Ross in view of Bergman and Ricci, and further in view of U.S. Patent No. 5,108,289 issued to Fukuyo (hereinafter "Fukuyo").

D. The rejection of Claims 1, 15, 22 and 25 under 103(a) as being unpatentable over U.S. Patent No. 4,468,200 issued to Munch (hereinafter "Munch") in view of Ross and Bergman.

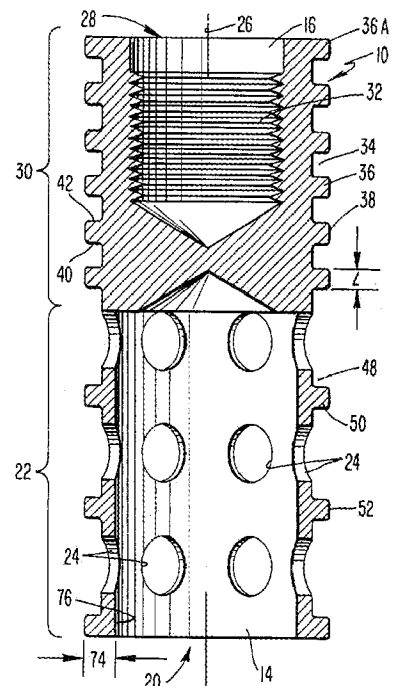
VII. ARGUMENT

Independent Claims 1 and 15, as well as their dependent claims, especially Claims 22 and 25, are improperly rejected under Section 103(a).

A. Claim 1-2, 4-5, 7-10, 12, 14-17 and 19 are Improperly Rejected Under Section 103(a) as Being Unpatentable Over Ross in view of Bergman and Ricci.

The Examiner's rejection of Claims 1-2, 4-5, 7-10, 12, 14-17 and 19 under Section 103(a) is improper because a person of skill would not be motivated to combine the references in the manner proposed. For example, the Examiner's rejection states that it would have been obvious to modify the closed loops grooves of Ross such that they have the depth and width taught by the secondary reference Bergman. However, this conclusion ignores that fact that the grooves for Ross and Bergman, as taught by these references, are for two different purposes. Accordingly, one of skill in the art would not be motivated by the teachings of Bergman to modify the grooves of Ross as suggested in the Final Office Action.

In rejecting independent Claims 1 and 15, the Examiner cites Ross as disclosing an implant with at least one groove "which extends all around an outer surface of the upper portion to form a closed loop" as recited in Claim 1 and "which extends in a closed track around a periphery of the implant" as recited in Claim 15. However, the Examiner acknowledges that Ross does not disclose, teach or suggest that the at least one groove has "a depth of between about 50 - 100 μm and having a width of between about 70 - 160 μm " as recited in these independent claims. As noted above, the Examiner states that Bergman discloses this depth and width limitation and that it would be obvious to modify the grooves of Ross to meet this limitation in light of the disclosure of Bergman. Applicant disagrees and suggests that the Examiner is not fully considering the teachings of the cited references.

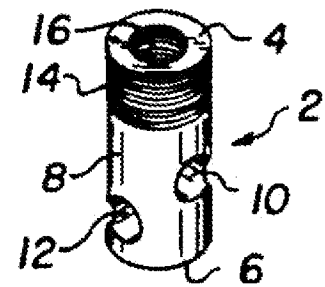


ROSS, FIG. 2.

Ross teaches a press-fit dental implant having a plurality of discrete circumferential grooves 34, 48 formed between ribs 36, 50 on a top part of the implant,¹ but does not teach actual dimensions for the grooves 34, 48. Importantly, Ross does not teach that the grooves 34, 48 prevent downward migration of soft tissues between the implant and bone tissue. Instead, Ross teaches that the surfaces 38 pressing against the wall 72 of the bore will resist the tendency for blood to gravitate along the wall 72, thereby promoting the formation of blood clots in the immediate vicinity of the bone tissue, which develops the necessary cells for bone formation to promote bone tissue regeneration and regrowth.² .

The embodiment of Figures 8-10 confirms that the surfaces 38, not the grooves, promote bone tissue regeneration and regrowth. Figures 8-10, and their related discussion, illustrate that the outer periphery of the body 112 is defined by a smooth cylindrical surface 113 rather than by alternating ribs and grooves (*see id.* at col. 7, lines 1-5). In this embodiment, blood flow is resisted and the clotting of blood is promoted (*see id.* at col. 7, lines 14-18), even without any groove, to obtain the same advantages (i.e., bone formation) described above with respect to Figures 1-3.

In contrast to Ross, Bergman teaches a dental implant that uses grooves 14 along an outer surface of the top portion of the implant that “are about 10 to 120 microns wide and about 10 to 100 microns deep.”³ The function of the grooves 14 is to enable epithelial and fibroblast cell growth “along the grooves but not between them” in order to prevent fibroblast and epithelial cell migration down the outer surface of the implant.⁴ Thus, unlike Ross, the Bergman grooves 14 provide the site for fibroblast and soft tissue growth. That is, Bergman discloses grooves specifically designed for fibroblast for soft tissue growth, such that the soft tissue does not migrate down the implant and displace bone tissue.



BERGMAN, FIG. 1.

Accordingly, in light of the teachings of these references, a person of skill has no reason to modify Ross by making the grooves 34 with a depth and width as taught by Bergman to

¹ Ross, Figure 3, col. 4, line 44 to col. 5, line 32.

² *Id.* at col. 6, lines 9-22 and 41-48.

³ *Id.* at col. 1, lines 61-64.

⁴ *See* Bergman, col. 1, lines 8-19 and col. 2, lines 51-54.

prevent downward migration of soft tissue.⁵ First, as noted above, the large grooves 34 of Ross serve a completely different function than the grooves 14 of Bergman. The Ross grooves 34 contact bone and extend deeply into the bore of the jawbone. In contrast, the grooves 14 of Bergman are configured to contact the soft tissue above the bone to prevent soft tissue from migrating downwardly along the outer surface of the implant. Thus, one of skill in the art would not even be motivated to consult the teachings of Bergman to modify the grooves of Ross.

Indeed, because the Ross grooves 34 extend deeply into the bore of the jawbone, according to the teaching of Bergman the proposed combination would result in soft tissue extending deeply into the jawbone following the modified grooves. However, Bergman clearly teaches away such soft tissue migration down the implant and thus teaches away from the combination proposed by the Examiner. Moreover, even assuming for the sake of argument there is motivation to combine the two references, *at best*, a person of skill in the art would apply the micro grooves 14 of Bergman to the uppermost outer surface of the Ross implant (above the grooves 34) in order to prevent the downward migration the soft tissue toward the grooves 34. However, even in this hypothetical combination, one of skill in the art would not modify the grooves of Ross to meet the limitations of Claims 1 and 15 as suggested by the Examiner but instead simply add the grooves of Bergman to the upper surfaces of Ross. However, such a combination would not meet the limitations of Claims 1 and 15.

The Final Office Action also improperly speculates how bone and soft tissue would respond when placed against different groove sizes or surfaces. Appellant reminds this Board that the mere fact that Ross and Bergman could be combined or modified does not mean that the proposed combination would be obvious unless the results would have been predictable to one of ordinary skill in the art,⁶ and indeed, bone tissue osseointegration and soft tissue growth are complex arts.⁷ For example, neither Ross nor Bergman (or anything else in the record) teaches or

⁵ See Final Office Action, page 3.

⁶ *KSR International Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1740-41 (2007).

⁷ See M.P.E.P. 2164.03 ("If one skilled in the art can readily anticipate the effect of a change within the subject matter to which the claimed invention pertains, then there is predictability in the art."). There is no evidence presented in the record that changes in the structure of an implant or surface pattern would create predictable bone osseointegration or soft tissue growth patterns. To the contrary, Ross and Bergman's isolated discussions of structures that are specific to either bone tissue or soft tissue—but not taught for both—indicate that simple interchangeability is not

otherwise suggests that their distinct surface structures could be interchangeably used with bone or soft tissue or otherwise predicts how bone or soft tissue would behave with different surface structures. Without such evidence or support, the Final Office Action makes an uncorroborated leap to argue that a person of skill would modify the Ross grooves with the dimensions taught by Bergman to prevent downward migration of soft tissues in order to thereby promote bone growth and osseointegration.⁸ To the contrary, Appellant submits that a person of skill understands that because soft tissue and bone tissue have different characteristics, groove dimensions optimized for soft tissue would not necessarily be effective or desirable for bone tissue.

Further, although the Final Office Action is unclear as to how Ricci applies to either Claim 1 or 15, Ricci provides little additional teachings that are not already present in Ross and Bergman.

Thus, Appellant respectfully submits that a person of skill would not modify Ross to provide an implant having at least one groove on an “upper portion [thereof that is] placed against an upper edge of the jaw bone, . . . [the groove] having a depth of between about 50 - 100 μm and having a width of between about 70 - 160 μm ,” as recited in Claim 1. A person of skill would also not modify the grooves of Ross to perform a method of placing an implant having an upper portion with “at least one groove which extends in a closed track around a periphery of the implant . . . having a depth of between about 50 - 100 μm and having a width of between about 70 - 160 μm ,” as recited in Claim 15.

Therefore, Appellant requests that this Board reverse the rejection of Claims 1 and 15, as well as their dependent claims, Claims 2, 4, 5, 7-10, 12, 14, 16, and 20-22 and 17-19, and 23-25.

B. Claim 1, 15, 22 and 25 are Improperly Rejected Under Section 103(a) as Being Unpatentable Over Munch in view of Ross and Bergman.

Claims 1, 15, 22 and 25 are improperly rejected under 103(a) as being unpatentable over Munch in view of Ross and Bergman. In rejecting these claims, the Examiner states Munch discloses “closed loop groove(s)” but admits that Munch does not disclose the claimed depth and

possible. Further, Ricci’s extensive discussion of scanning electron micrographs shows that persons of skill in the art must carefully measure and analyze the effects of changes in implant structure on bone osseointegration. Accordingly, bone osseointegration is not a predictable art.

⁸ See *id.*

width of the groove. Nevertheless, the Examiner states that “Ross in view of Bergman disclose an implant having an upper portion placed against an upper edge of the jawbone and having at least one closed groove, wherein the groove has the claimed range(s) for the groove width and depth.” The Examiner then states it would be obvious in light of Ross and Bergman to place the upper portion of Munch against the upper edge of the jawbone as taught by Ross and to adapt the grooves of Munch to the dimensions of Bergman. Applicant respectfully disagrees with these conclusions.

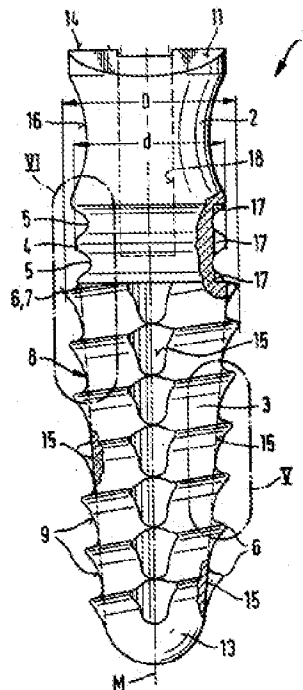
First, Applicant submits that the combination of Ross and Bergman is improper for at least the reasons set forth above in Section A above. As noted in Section A, the grooves in Ross and Bergman are for two different purposes. Accordingly, as set forth above, one of skill in the art would not be motivated by the teachings of Bergman to modify the grooves of Ross as suggested in the Final Office Action.

Moreover, in a similar manner, Munch is directed to a mandibular implant having a threaded bottom portion and an intermediate portion with annular notches 5 and an annular expansion 4.⁹ The annular notches 5 and the annular expansion 4 are provided to so that “[n]ewly formed bone will grow over the notches and expansion”¹⁰ to “promote and growth of the implant and improve its anchoring into the mandibular crest.”¹¹ Above, the annular notches 5 and the annular expansion 4 is a concave section 16 to receive the epithelial sleeve. These features are shown below in the partial view of Figure 2.

⁹ See Munch, col. 3, lines 34-37.

¹⁰ See *id.*

¹¹ See *id.* at col. 3, lines 4-8.



MUNCH, FIG. 2.

The Final Office Action acknowledges that Munch is silent with regard to the dimensions of the annular notches 5 and the annular expansion 4, as well as their placement relative to the jawbone.¹² However, Munch explicitly teaches that the notches 5 and expansion 4 would be covered by newly grown bone.¹³ However, as described above, the Bergman grooves 14 provide the site for fibroblast and soft tissue growth. That is, Bergman discloses grooves specifically designed for fibroblast for soft tissue growth, such that the soft tissue does not migrate down the implant and displace bone tissue. It is undesirable to have soft tissue growth where bone tissue growth is desired because osseointegration is more difficult where there is soft tissue growth. Accordingly, one of ordinary skill in the art would not be motivated to combine features of grooves configured for soft tissue (i.e. Bergman) with grooves configured for bone tissue (i.e., Munch).

Moreover, even assuming for the sake of argument that there is motivation to combine these references, a person of skill, *at best*, would add the grooves 14 of Bergman to the concave section 16 of the Munch implant (i.e., above the notches 5 and expansion 4) in order to prevent

¹² See Final Office Action, page 5.

¹³ See Munch, col. 3, lines 34-37.

downward migration the soft tissue. Such a hypothetical combination would not result in the modification of the grooves of Munch as proposed by the Examiner.

Thus, Appellant respectfully submits that a person of skill would not modify Munch to provide an implant having at least one groove on an “upper portion [thereof that is] placed against an upper edge of the jaw bone, . . . [the groove] having a depth of between about 50 - 100 μm and having a width of between about 70 - 160 μm ,” as recited in Claim 1. Further, a person of skill would not modify Munch to provide a method of placing an implant having an upper portion with “at least one groove which extends in a closed track around a periphery of the implant . . . having a depth of between about 50 - 100 μm and having a width of between about 70 - 160 μm ,” as recited in Claim 15.

Therefore, Appellant requests that the rejection of Claims 1, 15, 22 and 25 be reversed.

1. The Proposed Combination of Munch, Ross, and Bergman to Reject Claims 22 and 25 is Improper.

A person of skill would not combine Munch, Ross, and Bergman to create an implant or method in which the implant has an “outer thread” and a groove “having a depth of between about 50 - 100 μm and having a width of between about 70 - 160 μm ,” as recited in Claims 22 and 25.

Munch does teach a threaded implant that can be screwed into the jawbone. In contrast, both Ross and Bergman teach press-fit implants. Although Munch illustrates an implant having an outer thread, there is no reason why a person of skill would modify the notches 5 and expansion 4 of Munch using the Bergman grooves as indicated above. Further, Ross does specifically not relate to threaded implants¹⁴. Hence, the person of skill would not be motivated to apply teachings of Ross to a threaded implant.

Ross and Bergman emphasize that the holes and openings in their press-fit implants are necessary for osseointegration and allow the implant to be placed using a separate drilling procedure.¹⁵ Appellant submits that a person of skill understands that a press-fit implant is much different than a threaded implant—both structurally and in the method of placement. These features are not merely interchangeable and there is no reason provided in the Final Office Action

¹⁴ See Ross, col. 6, lines 59-60.

that would justify that features of press-fit implants are applied to a threaded implant. Without such a reason, the combination is improper.

Thus, Appellants respectfully request that this Board reverse the rejection of Claims 22 and 25.

C. Claims 18, 20-21, and 23-24 are Improperly Rejected Under Section 103(a)

Claim 18 is rejected under Section 103(a) as being unpatentable over Ross in view of Bergman and Ricci, and further in view of Cottrell. Further, Claims 20-21 and 23-24 are rejected under 103(a) as being unpatentable over Ross in view of Bergman and Ricci, and further in view of Fukuyo. Appellant respectfully submits that Claims 18, 20-21, and 23-24 should be allowable based on their own merit and for at least the reason that these claims depend from allowable independent base claims. Accordingly, Appellant respectfully requests that this Board reverse the rejection of Claims 18, 20-21, and 23-24.

D. Conclusion

As discussed above, the rejection under Section 103(a) is improper because the proposed combinations are improper and are the result of impermissible hindsight reasoning. The Final Office Action fails to provide any valid reason why a person of skill would otherwise modify the combination to produce the dental implant and method recited in Claims 1 and 15. Accordingly, Appellants respectfully ask this Board to reverse the rejections of Claims 1, 2, 4, 5, 7-10, 12, and 14-25 under Section 103(a).

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By: /Rabinder N. Narula/
Rabinder N. Narula
Registration No. 53,371
Attorney of Record
Customer No. 20995
(949) 760-0404

¹⁵ See Bergman, col. 2, lines 11-25 and Ross, col. 6, lines 45-48.

VIII. CLAIMS APPENDIX

Inserted below as a Claims Appendix is a copy of the rejected claims in the present Application. Claim 1, 2, 4, 5, 7-10, 12, and 14-25 are being appealed. For clarity, Appellants have indicated which claims are the subject of the present Appeal using the parentheticals (Not Appealed) or (Under Appeal).

1. **(Under Appeal)** A dental implant for insertion into a hole formed in jaw bone and overlying soft tissue, the dental implant comprising:

an upper portion to be placed against an upper edge of the jaw bone, the upper portion comprising at least one groove which extends all around an outer surface of the upper portion to form a closed loop and which extends substantially in a cross sectional plane at right angles to the longitudinal axis of the implant, said groove having a cup-shaped cross section and having a depth of between about 50 - 100 μm and having a width of between about 70 - 160 μm .

2. **(Under Appeal)** The dental implant as in claim 1, wherein each groove has a cross section of semi-circular shape.

3. **(Canceled)**

4. **(Under Appeal)** The dental implant as in claim 1, wherein each groove has a cross section of hyperbola shape or semi-elliptical shape.

5. **(Under Appeal)** The dental implant as in claim 1, wherein each groove has a rectangular cross section with rounded corners.

6. **(Canceled)**

7. **(Under Appeal)** The dental implant as in Claim 1, wherein the ingrowth of bone into said groove prevents visible exposure of these parts.

8. **(Under Appeal)** The dental implant as in claim 1, wherein bone ingrowth established in the groove also prevents bacteria and/or organisms from passing down from the upper parts of the dental implant to the underlying parts of the dental implant.

9. **(Under Appeal)** The dental implant as in claim 1, wherein the groove is located at an upper part of the upper portion.

10. **(Under Appeal)** The dental implant as in claim 1, wherein the dental implant includes a groove of the upper portion that is coordinated with grooves on another portion of the dental implant.

11. **(Canceled)**

12. **(Under Appeal)** The dental implant as in claim 1, wherein the depth of the groove is about 70 μm .

13. **(Canceled)**

14. **(Under Appeal)** The dental implant as in claim 1, wherein the width of the groove is about 110 μm .

15. **(Under Appeal)** A method of placing a dental implant, the method comprising:

providing an implant having an upper portion comprising at least one groove which extends in a closed track around a periphery of the implant and which extends substantially in a cross sectional plane at right angles to the longitudinal axis of the implant, said groove having a cup-shaped cross section and having a depth of between about 50 - 100 μm and having a width of between about 70 - 160 μm ;

installing the implant into a jaw bone of a patient; and

positioning the upper portion of the implant against an upper edge of the jaw bone, the groove stimulating bone movement and bone ingrowth to form a barrier against substantial or visible subsidence, around the portion, of the jaw bone with overlying soft tissue.

16. **(Under Appeal)** The dental implant as in claim 1, wherein the groove extends in a continuous loop around the outer surface of the upper portion of the implant.

17. **(Under Appeal)** The method as in claim 15, wherein the groove extends in a continuous loop around the outer surface of the upper portion of the implant.

18. **(Under Appeal)** The method as in claim 15, further comprising aligning an arc-shaped portion of the implant to follow a correspondingly arc-shaped edge of the jaw bone.

19. **(Under Appeal)** The method as in claim 15, further comprising positioning the groove below a top surface of the jaw bone adjacent the upper edge of the jaw bone.

20. **(Under Appeal)** The dental implant as in claim 1, further comprising an implant part situated above the upper portion.

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21. **(Under Appeal)** The dental implant as in claim 20, wherein the implant part situated above the upper portion is provided without any groove(s).

22. **(Under Appeal)** The dental implant as in claim 1, further comprising an outer thread by means of which the implant can be screwed into the hole.

23. **(Under Appeal)** The method as in claim 15, wherein the implant further comprises an implant part situated above the upper portion.

24. **(Under Appeal)** The method as in claim 23, wherein the implant part situated above the upper portion is provided without any groove(s).

25. **(Under Appeal)** The method as in claim 15, wherein the implant further comprises an outer thread by means of which the implant can be screwed into the hole.

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IX. EVIDENCE APPENDIX

Appellants are submitting no evidence with this appeal.

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X. RELATED PROCEEDINGS APPENDIX

Appellants are unaware of any related appeals or interferences.

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